



# 2012 E2S2 — CARB's New Mobile Equipment Regulations

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# Government and Industry Partnership

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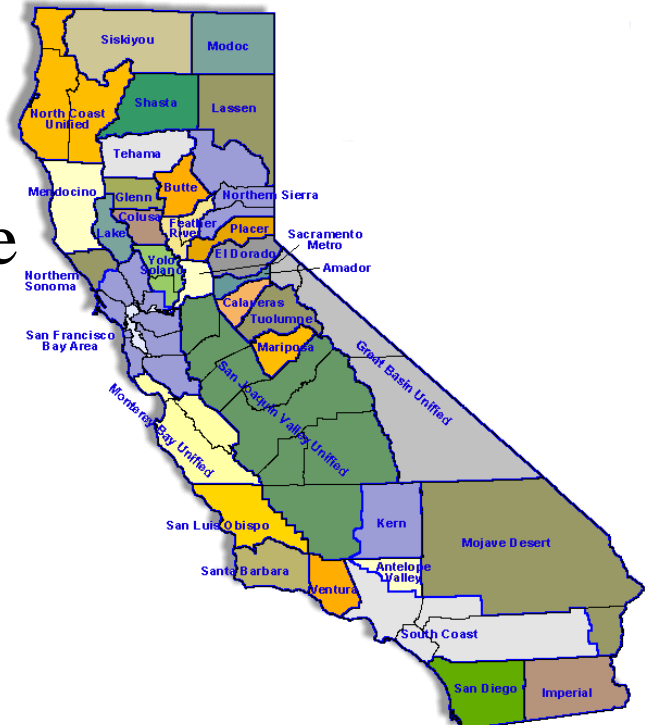
- Jorge Rodriguez
  - CARB regulatory overview and related URS activities
- Mark G. Weir
  - U.S. Navy Fleet Readiness Center Southwest (FRCSW) organizational compliance program execution

# California Air Quality

- Population – 37,691,912 (*July 2011 U.S. Census*)
- Vehicles – 31,987,821 (*2010*)
- Several non-attainment areas for 8-hr ozone
- Emission reductions from Mobile sources
- >40,000 trucks/day



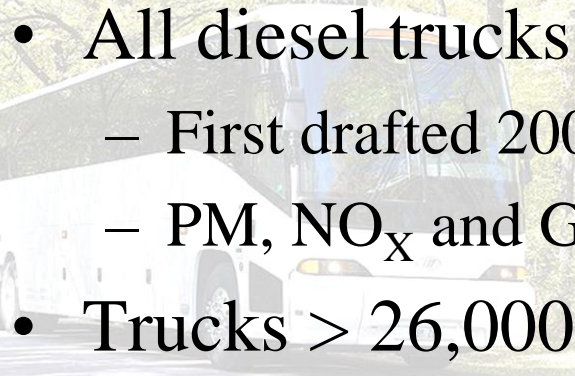
California Air Districts



- In 1998, California Air Resources Board (ARB) identified diesel particulate matter (diesel PM) carcinogenic
- Diesel Risk Reduction Plan (DRRP) – 2000
  - New standards
  - Control technology
- First ATCMs
  - Idling restrictions on school buses (2002)
  - Stationary engine (2003)



## *Truck and Bus Regulation*

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- A faded background image of a white bus parked on a street with trees in the background.
- All diesel trucks, GVWR >14,000 lbs
    - First drafted 2008, Finalized 2011
    - PM, NO<sub>x</sub> and GHG
  - Trucks > 26,000 lbs, required retrofits
  - Replace all trucks when 20 years or older
    - EPA MY 2010 standards (NO<sub>x</sub> and PM)
  - Exemption:
    - Tactical vehicles
    - Low-use (less than 1,000 miles per year)

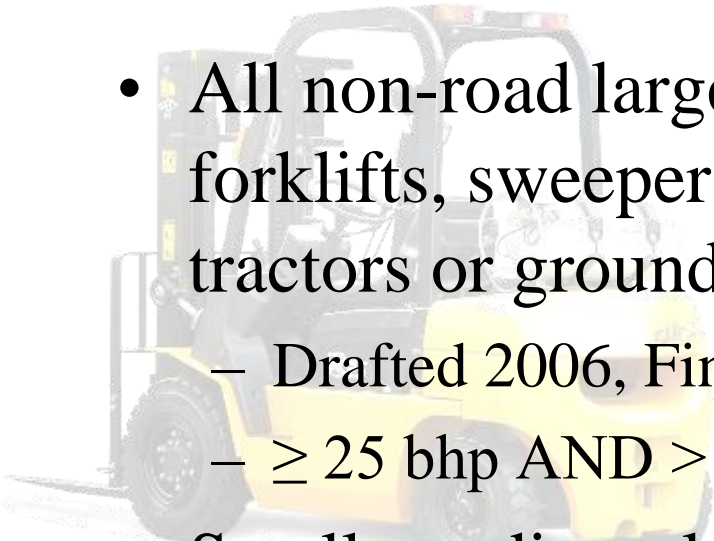


- All non-road mobile diesel equipment, engine  $\geq$  25 bhp
  - First drafted in 2007, final amendments 2011
  - PM and NO<sub>x</sub>
- Initial compliance date 1/1/2014
- Small, medium and large fleets
- Fleet averaging (weighted)
- Other requirements:
  - Reporting, labeling, idling



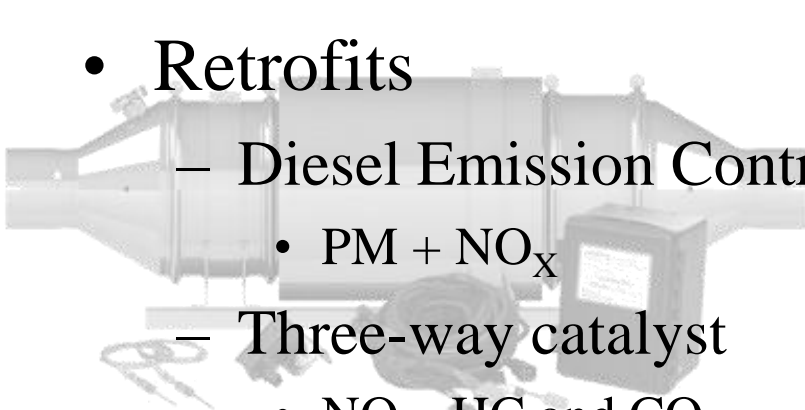
# *Large Spark-Ignition Regulation*

- All non-road large spark-ignition (LSI) engine forklifts, sweepers/scrubbers, industrial tow tractors or ground support equipment (GSE)
  - Drafted 2006, Final amendments 2011
  - $\geq 25$  bhp AND  $> 1.0$  L displacement
- Small, medium, large fleets
- Forklift vs. non-forklift
- Fleet averaging





- Retirements
- Replacements
  - T&B: MY 2010 Standard
  - ORD: Tier 4 Non-road Engine Standard
  - LSI: MY 2010 Standard (CA only)
- Retrofits
  - Diesel Emission Control Strategies (DECS)
    - PM + NO<sub>x</sub>
  - Three-way catalyst
    - NO<sub>x</sub>, HC and CO





# EPA Waivers

## California Waivers and Authorizations

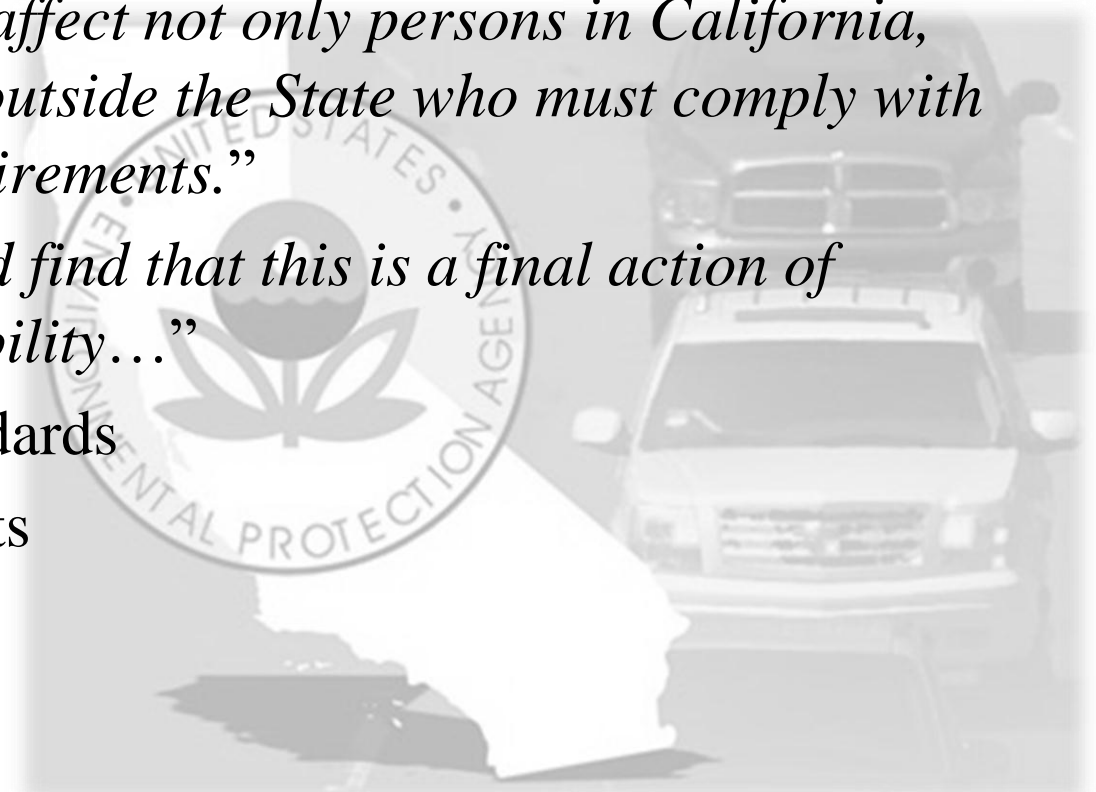
Date/ Volume	Title and Action
	Truck and Bus
	Large Spark-Ignition Engines and Fleets
April 4, 2012 Volume 77, Number 65 pp. 20388-20392	– CARB notes request is w/in scope of previous waiver of Federal Preemption
October 31, 2011 Volume 76, Number 210 pp. 67184-67186	– Idling Requirements, approved February 6, 2012
	ORD
	Portable Diesel Equipment
February 9, 2011 Volume 76, Number 27 pp. 7196-7198	– EPA has not granted this waiver (2008)
	LSI
February 9, 2011 Volume 76, Number 27 pp. 7194-7196	– EPA granted CARB waiver on April 4, 2012
	Mobile Cargo Handling Equipment
February 21, 2012 Volume 77, Number 34 pp. 9916-9923	– Standards and fleet requirements

- Region XI Regional Environmental Coordinator (REC) highly involved
- Secured tactical vehicles exemption for all regulations
- Blanket exemptions for both NALF San Clemente Island and NBVC San Nicolas Island



## Nationwide Impacts

- CA laws resonates throughout the nation
  - “...decision will affect not only persons in California, but also entities outside the State who must comply with California's requirements.”
  - “...determine and find that this is a final action of national applicability...”
  - New engine standards
  - Fleet requirements







# Fleet Readiness Center Southwest, San Diego, CA



## *Maintenance Repair Organization*

- Navy and Marine Corps aircraft and shipborne systems
- Components and Engines
- Manufacturing
- Engineering and Logistics



# Fleet Readiness Center Southwest, San Diego, CA

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- Diverse industrial workforce of 4,225 personnel
  - 2,675 civil service employees, 550 contractors and 1,000 active duty military
  - 5 labor unions
  - Footprint: 358 acres, 80 bldgs, 45 metric tons CO2E
  - 2009 SECDEF Award for Industrial Installation Sustainability, 2008 Shingo Silver Medallion, 2009 CAPE Eureka Award
  - Registered AS9100, AS9110, ISO 9001 and ISO 14001
- Platforms
  - Aircraft – FA-18, E2/C2, CH-53, H-60
  - Shipborne – LM-2500 gas turbine engines, aircraft carrier catapults, arresting gear and landing systems



# California based Naval Stakeholders

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- Command Levels
  - All commands within California
- NAVFACSW
  - Provides consolidate support for California ATCM compliance activities
  - Owns, operates and leases to other commands the largest share of Naval Material Handling Equipment (MHE), i.e., forklifts
- CNO N45
  - Maintains oversight of environmental compliance activates



# FRCSW Forklifts

## LSI Fleet Attributes

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- Organizational

- FRCSW is a Navy Working Capital Fund (NWCF) organization
- Forklifts owned by 10 industrial operational cost centers within FRCSW
- Each cost center must budget for and establish their individual product/service/labor rates

- Functional

- Approximately 60 vehicles
- Some as old as 28 yrs, some new, average fleet age is 15 yrs
- Mostly 4K and 6K units
- Approximately 10 electric units
- Initial fleet average is **8.5** g/bhp-hr NOx + HC





# FRCSW Forklifts Fleet Attributes





# LSI Compliance Strategy Short Term

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- Normal attrition and replacements – fleet average **5.7** g/bhp-hr
- Low use exempt – approximately 30 units
  - Implement low use management program
  - Investigate the use of a COTS based Centralized Fleet Automated Management System (CFAMS)
- Tactical exempt – approximately 10 units
- Retrofits – none
- Low use and tactical exemptions – result in fleet average of **3.0** g/bhp-hr
- New replacements – 5 units – results in fleet average of **0.9** g/bhp-hr



# LSI Compliance Strategy Long Term

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- Dispose of older [non-compliant] units
- Implement COTS based Centralized Fleet Automated Management System (CFAMS)
- Pool remaining units and share



# Benefits of Phased Strategy Approach

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## Low Use Exemption Strategy

- Lowers immediate capital replacement costs
- Higher operating and maintenance costs for larger fleet
- Achieves compliance quickly

## Fleet Reduction Strategy

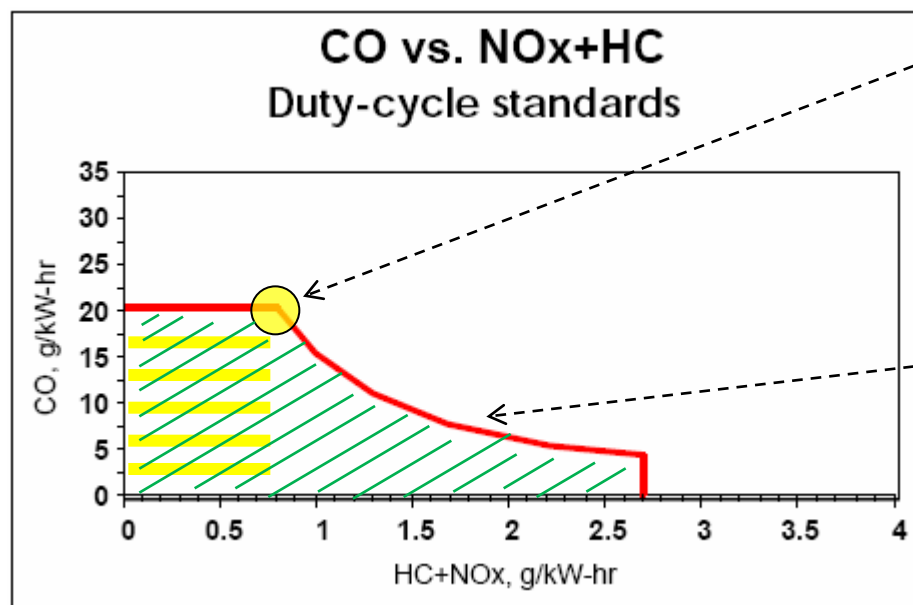
- Lowers unit cost via shared resources and improved utilization
- Lowers operating and maintenance costs for smaller fleet
- Maintains lifecycle compliance





# National Impacts

- California's LSI engine regulation is a refinement of the EPA LSI regulation – it would be fair to say the two regulations are “harmonized”



*California regulation is a point on the line segment represented at 0.6 g/bhp-hr HC+NO<sub>x</sub> [equivalent to 0.8 g/KW-hr]*

*EPA regulation is the whole line segment*



# National Impacts

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- Manufacturers who comply w/ California are in compliance w/ EPA
- Most [if not all] manufactures will build engines meeting the California regulation, i.e., they will not build different models engines for California only
- Fleet averaging is required only by CARB in California – necessitating replacements, purchases and/or retrofits. The balance of the Nation will achieve equivalent emissions performance in time as a consequence of natural vehicle attrition.